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AIR FORCE INSTITUTE OF TECHNOLOGY
School of Engineering
Department of Systems Management

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SOME IMPLICATIONS OF DEFENSE PROCUREMENT CIRCULAR 76-3
ON DEFENSE CONTRACTOR PROFITS.

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) DPC 76-3 implemented several significant changes to DOD profit policy. Two of these changes are intended to directly encourage defense contractor investment in facilities. First, the imputed cost of capital for facility investment (as defined by CAS 414) is now considered to be an allowable cost. Second, the contractor's level of facility investment is now recognized as an element of the profit objective. The purpose of this study was to examine how these changes to the DOD profit policy could influence the amount of profit earned. Of particular interest		

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was the level of facilities investment needed to maintain profits at the level attainable under the old DOD profit policy.

There is a direct relationship between a contractor's facilities investment and the level of contractor total profits (net profit objective plus cost of money). It was demonstrated, however, that total profits attainable under the new profit policy may well be less than profits attainable under the old policy. Moreover, except at relatively high levels of facilities investment, the amount of profit offset normally is greater than the amount allowed for cost of money.

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SOME IMPLICATION OF DEFENSE PROCUREMENT CIRCULAR 76-3
ON DEFENSE CONTRACTOR PROFITS

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Introduction

The Department of Defense (DOD), as of October 1, 1976, significantly revised its profit and pricing policy for negotiated defense contracts. Among other purposes, this new policy is intended to stimulate defense contractor capital investment in more modern facilities and equipment for more efficient and economical performance.

The revised policy emanated from a study of defense contractors' profits directed by Deputy Secretary of Defense W. P. Clements and called "Profit '76." Although more than 50 studies of defense contractor profits had previously been accomplished, a definite need for some changes in defense profit policy was still apparent. The number of contractors bidding on defense work had decreased. Obsolete equipment was being used by defense contractors. The availability of capital for plant and facility modernization was low and the cost high to defense contractors. Productivity was perceived as having decreased. The Cost Accounting Standards Board had recently issued a standard on depreciation, which many within both industry and government perceived as possibly causing a reduction in the profits earned on defense contracts.

The "Profit" study of 62 contractors found that for the five fiscal years 1970-1974 profits before taxes for commercial work were

about 17.1 percent on sales of 8.5 billion dollars, but only about 4.7 percent on defense sales of 12.9 billion dollars. Similarly, the average return on investment was 17.6 percent for commercial work, but only 13.5 percent for defense work (presuming that contractors furnished all their own facilities and equipment).¹

Introducing the new profit policy, Mr. Frank A. Schrontz, Assistant Secretary of Defense (Installations and Logistics), stated:

Over the last several years, the level of contractor facility investment in Department of Defense contracts has been considerably lower than in comparable commercial endeavors, even after taking into account government-furnished facilities and equipment. The reasons for contractor reluctance to invest in modern machinery and equipment for use on DOD contracts are many and varied, but it is clear that some are rooted in present procurement policy which fails to recognize adequately (either in profit or as an allowable cost) the facility investment which may be required for efficient operation...²

The Issue

As a result of the "Profit '76" study findings, several significant changes were made to the DOD profit policy. Two of these changes are intended to directly encourage defense contractor investment in facilities. First, the imputed cost of capital for facility investment (as defined by Cost Accounting Standard 414, Cost of Money as an Element of Cost of

¹Coopers and Lybrand, a report to the DOD Profit '76 Study Group, as cited by the Comptroller General of the United States in a report to the Secretary of Defense, Report No. B-159896; PSAD-77-75 (Washington, February 17, 1977), p. 2.

²Assistant Secretary of Defense (Installations and Logistics), Defense Procurement Circular (DPC) Number 76-3, (Washington; September 1, 1976), p.i.

Facilities Capital) is now considered to be an allowable cost for most negotiated DOD contracts which are priced on the basis of cost analysis. Second, the contractor's level of facility investment is now recognized in reaching a prenegotiation profit objective under the weighted guidelines method.

The principal objective of these profit policy changes is the use of profits as a motivating force to increase contractor capital investment in modern facilities. It is not the intent of this study to question whether these policy changes do indeed motivate contractor capital investment. Rather, the purpose of this study is to examine how these changes to the DOD profit policy can influence the amount of profit earned by DOD contractors. Of particular interest is the level of facilities investment needed to maintain profits at the level attainable under the "old" DOD profit policy.

Before discussing the potential influence of facilities investment on contractor profits, one first needs an understanding of those provisions of the new profit policy which address facilities investment. The next section of this study thus presents an overview of the derivation of contract facilities capital employed, the imputed contract facilities capital cost of money, and the profit objective for facilities investment.

Facilities Investment

As was noted above, a primary purpose of the new DOD profit policy is to stimulate defense contractor capital investment in more modern facilities and equipment so as to achieve more efficient and economical performance. Thus, the first requirement of the new profit policy is to define and measure facilities capital.

Definition of Facilities Capital

Cost Accounting Standard (CAS) 414 defines facilities capital as the net book value of tangible capital assets and of those intangible assets subject to amortization.³ Tangible capital assets are those assets that have physical substance and more than minimal value and are expected to be held by the contractor for continued use beyond the current accounting period for the services they yield. Tangible assets include the net book value of contractor owned fixed assets, the capitalized value of leases for which constructive costs of ownership are "allowed" in lieu of rental costs, and an allocable share of corporate owned or leased assets. Intangible capital assets meet the same basic criteria as tangible capital assets except that they have no physical substance. Included would be such assets as the capitalized costs of patents, trademarks, and computer software.

Measurement of Facilities Capital

Measurement of these tangible and intangible capital assets may be on either an historical or a projected basis. The historical approach measures the present book value of existing assets, whereas the projected approach essentially is based on budgetary projections of future facilities investment. The historical basis will normally be used to measure a contractor's facilities investment. The projected basis would be used only in those instances where significant increases or decreases in a

³Cost Accounting Standards Board, Cost Accounting Standard 414 - Cost of Money as an Element of the Cost of Facilities Capital, (March 5, 1976), par. 414.30.

contractor's facilities investment are anticipated. Although these two measurement approaches will by definition produce materially different results, these differences are not relevant to the stated purpose of this study.

Contract Facilities Capital Employed

After determining the total dollar value of facilities capital to be recognized, the next step is to allocate the dollar amount of this capital to specific contracts. This allocation process closely parallels the allocation of indirect costs to contracts. Figures 1 and 2 demonstrate this allocation of facilities capital costs to a given contract.⁴

The total recognized facilities capital of the contractor (or business unit thereof) is either directly or indirectly allocated to relevant indirect cost pools (overhead, certain service units, and G&A). All assets that can be identified in the contractor's records as solely applicable to an organizational unit corresponding to a specific indirect cost pool will be distributed directly thereto. Of the \$8,720,000 total facilities recognized in Figure 1, \$5,570,000 is directly distributed.

Undistributed facilities are those assets that cannot be wholly assigned to a single indirect cost pool, because they benefit and are

⁴Figures 1 and 2 deviate from both the CAS 414 and the DPC 76-3 procedures as to the sequence of steps to arrive at the dollar amounts of facilities capital employed on a contract and the cost of money of that facilities capital. This deviation is intended to highlight the allocation of facilities capital to contracts. Whereas Figures 1 and 2 directly compute the total cost of facilities capital employed on a contract and derive the contract facilities cost of money therefrom, present CAS and DPC procedures directly compute the cost of money and derive therefrom the total cost of facilities capital employed.

FIGURE 1

Derivation of Facilities Capital Employed Factors

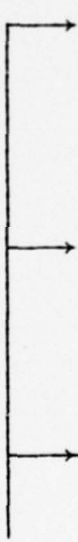
<u>Facilities Net Book Value</u>		<u>Overhead Pools</u>		<u>Facilities Capital Employed Factors</u>	
<u>Accumulated</u>	<u>Direct Distribution</u>	<u>Allocation of Undistributed</u>	<u>Total Net Book Value</u>		<u>Allocation Base</u>
Business Unit Assets					
Tangible					
Land	\$1,900,000				
Buildings	2,000,000				
Equipment	4,000,000				
Intangibles	100,000				
Capitalized Leases	270,000				
Home Office and/ or Corporate	450,000				
Total Facilities Values Recognized	\$8,720,000				
					
Indirect Cost Pools					
Engineering	\$ 320,000	\$ 756,000	\$1,076,000	2,969,100 (DL\$)	
Manufacturing	4,000,000	2,150,000	6,150,000	2,186,700 (DL Hrs)	
Technical Computer	300,000	144,000	444,000	3,000 (Comp Hrs)	
General and Administrative	950,000	100,000	1,050,000	55,643,900 (Tot Cost Input)	
TOTAL DISTRIBUTIONS	\$5,570,000	\$3,150,000	\$8,720,000		

FIGURE 2

Contract Facilities Capital Employed and Cost of Money

<u>Indirect Cost Pools</u>	<u>Contract Allocation Base</u>	<u>Facilities Capital Employed</u>	
		<u>Factors</u>	<u>Amount</u>
Engineering	\$ 1,650,000	\$.3624	\$ 598,000
Manufacturing	800,000 (DL Hrs)	2.8125	2,250,000
Technical Computer	1,000 (Comp Hrs)	148.0000	148,000
G&A	26,495,000	.01887	500,000
Contract Facilities Capital Employed		\$3,496,000	
Facilities Capital Cost of Money Rate*		8.25%	
Contract Facilities Capital Cost of Money		288,420	

*The arithmetic mean of the interest rates specified by the Secretary of the Treasury Pursuant to P.L. 92-41 (85 Stat 97)

utilized by more than one organizational unit. These undistributed assets (\$3,150,000 in Figure 1) are allocated to the various indirect cost pools on any reasonable basis that approximates the usage of these facilities.

The net book value of the total facilities assigned to each indirect cost pool is divided by the allocation base of that cost pool to arrive at a facilities capital employed factor. Each allocation base unit of measure must be compatible with the base used to allocate indirect costs to federal contracts and must include all work done in the organizational unit(s) associated with the indirect cost pool.

These facilities capital employed factors are in turn used to arrive at the dollar amount of contract facilities capital employed (Figure 2). This dollar amount is computed by multiplying the relevant facilities capital employed factor of each indirect cost pool by the contract's estimated "share" of the cost pool's allocation base. The resultant dollar amount of contract facilities capital employed in turn forms the basis for both deriving the contract facilities cost of money and determining the dollar amount of profit to be negotiated based on facilities investment.

Contract Facilities Capital Cost of Money

The contract facilities cost of money is simply the product of the contract facilities capital employed (\$3,496,000 in Figure 2) and the arithmetic mean of the interest rates specified by the Secretary of the Treasury pursuant to Public Law (P.L.) 92-41 (85 Stat 97). Although an imputed cost (i.e., a cost not specifically incurred), the contract facilities cost of money is allowable as per the provisions of Armed

Services Procurement Regulation (ASPR) 15-205.50. This imputed cost is not, however, part of the cost base used to determine the contractor's profit objective.

Profit on Facilities Investment

Contract facilities capital employed also is a factor in determining the investment risk associated with contract performance. Six to ten percent of the net book value of facilities capital allocated to a contract will normally be assigned for this profit factor. Major factors to consider in this profit range are (1) whether the facilities are general or special purpose items, (2) the age of the facilities, (3) the undepreciated cost of the facilities and (4) the relationship of the remaining life over which the investment may be written-off vis-a-vis the length of the program(s) or contract(s) on which the assets are to be employed. More weight is to be given to facility investment to be made during the course of the contract (normally 8-10%) than to existing facilities (normally 6-8%). The resultant dollar amount of profit associated with the contractor's facilities investment in turn becomes part of the contractor's overall profit objective.

Relationships Between Facilities Capital Cost of Money and

Profit On Facilities Investment

"Profits" may be generally defined as the excess of revenues over expenses (costs incurred). In the context of defense contracts, profits are the excess of the contract price over costs incurred. Those defense

contracts priced on the basis of cost analysis will normally have profits negotiated as a separate line item of contract price based on the weighted guidelines method. This method considers contract effort (costs), contract risk and facilities investment in the determination of planned profits (profit objective).

Introducing the new profit policy, the Department of Defense stated:

The relative weight mix of the major profit determinants has been revised. Under the policy in effect since January 1964 the prenegotiation profit objective determinants were as follows: (i) Contractor's Input to Total Performance (65% of Total); (ii) Contractor's Assumption of Contract Cost Risk (30% of Total); and (iii) All other factors (5% of Total). Under this revised policy the breakdown is as follows: (i) Contractor Effort (50% of Total), (ii) Cost Risk (40% of Total), and (iii) Investment (10% of Total).⁵

Given these profit determinants, the basic profit objective can be expressed as

$$\text{BPO} = \text{CE} + \text{CR} + \text{I} \quad (1)$$

where BPO = basic profit objective

CE = contractor effort: that portion of profit based on contract costs

CR = cost risk: that portion of profit based on contract cost risk assumed by the contractor

I = investment: that portion of profit based on contract facilities investment.

As was noted in the preceding section, a contractor's facilities investment contributes to two elements of the contract price; (1) an

DPC 76-3, pp. 1-2. Contractor Effort and Contractor's Input to Total Performance are equivalent terms and reflect the total estimated cost of the contract. So that the same administrative procedures can be used to determine the profit objective for this area, an adjustment factor of .7 is used to reduce the weight of contractor effort from 65% of the prenegotiation profit objective to 50%.

allowable cost of money and (2) an element of the negotiated contract profit. By explicitly recognizing facilities capital cost of money, however, the new defense profit policy (as enunciated by DPC 76-3) now recognizes as an allowable, nonprofit bearing cost what was previously paid to defense contractors as profit. In order to not increase the overall contract price, some reduction in the stated profit objective was considered necessary to adjust for the addition to contract price of the facilities capital cost of money. To accomplish this adjustment, the new profit policy incorporates procedures so that "...on the average the contracting officer's prenegotiation profit objective takes into account (and offsets) the cost increase attributable to the imputed cost of facility capital."⁶ Although not explicitly stated by DPC 76-3, this offset is achieved on the average by multiplying the "contractor effort (CE)" portion of the basic profit objective by an adjustment factor of .7.

It becomes apparent, therefore, that the "total profit" on any defense contract negotiated under the new defense profit policy consists of two elements, viz., (1) the net profit objective and (2) the facilities capital cost of money. "Total Profits" thus may be expressed as

$$TP = NPO + FCCM \quad (2)$$

where TP = "total profits"

NPO = net profit objective; the basic profit objective adjusted
on the average for facilities capital cost of money.

FCCM = facilities capital cost of money

⁶Ibid., p. i.

The net profit objective in turn can be defined as

$$\text{NPO} = .7\text{CE} + \text{CR} + \text{I} \quad (3)$$

where .7CE reflects the result of offsetting, on the average, facilities capital cost of money and the other terms are as defined above.

Using a greatly simplified example, Figure 3, Columns A and B, illustrates the differentiation of "total profit" into the two elements of profit and cost of money. Columns B and C in turn illustrate the offset of cost of money so as to avoid increasing the contract price.

Given that on the average the facilities capital cost of money is offset so as to not increase the contract price, note that this offset of itself also does not necessarily decrease the contract price. The contract price is in essence simply the summation of allowable costs and "total profits," the latter element in turn being separated into the basic profit objective, as adjusted, and cost of money.

Given that the contract price is the total of allowable costs and "total profits," one can readily see that the contract price is directly influenced by the relationship of the amount of facilities capital cost of money (FCCM) vis-a-vis the dollar amount of the offset to the basic profit objective. Substituting for NPO in equation 2, one finds that

$$\text{TP} = .7\text{CE} + \text{CR} + \text{I} + \text{FCCM} \quad (4)$$

If the amount of the offset (.3CE) equals FCCM, "total profits" on a given contract will essentially be equal to the basic profit objective and there will be little if any influence on contract price. If, however, FCCM is greater than .3CE, the contract price will increase. Conversely, the contract price will be less, if FCCM is less than .3CE.

FIGURE 3

Profit Concepts

Weighted Guidelines
Prior to Profit '76
(No Consideration for
Facilities Investment)

A

Estimated Cost	
\$10,000,000	
Profit Objective	
\$ 1,200,000	

Price
Profit Objective
Cost of Money
as a % of Cost
Total Profit

\$11,200,000
12%
-
12%

Weighted Guidelines/Profit '76
Facilities Investment Recognized

Cost of Money
Offset

B

Estimated Cost	
\$10,000,000	
Net Profit Objective	
\$ 1,000,000	
Cost of Money	
\$ 200,000	

\$11,200,000
10%
2%
12%

Cost of Money
Not Offset

C

Estimated Cost	
\$10,000,000	
Profit Objective	
\$ 1,200,000	
Cost of Money	
\$ 200,000	

\$11,400,000
12%
2%
14%

Does Facilities Investment Influence Profits?

An article in the January 10, 1977 issue of Business Week indicated the belief that the profits of defense contractors would increase.

Higher profits. Basic changes in Defense Dept. procurement policies mean that new production contracts should generate higher profits than the meager levels of recent years...⁷

Defense contractors...are pleased by shifting Pentagon policies designed to encourage greater industry profitability...⁸

Previously, only program costs and risk counted in making profit calculations. Now companies that plan to make capital investments on any program can earn up to 10 percent more profit on it...⁹

One may question, however, whether profits will in fact increase. The Council of Defense and Space Industry Associations (CODSIA) expressed reservations as to the proposed profit policy changes.

...industry's review of the revised policy indicates that the likely outcome of the proposed ASPR revision will be an overall lowering of profit rates. Companies have indicated that tests of applications to individual contracts show a general overall reduction of from 1 to 2 points in future negotiated profit rates.¹⁰

In general, a number of sources have expressed the view that profits would be increased for capital intensive industries/contracts, but decreased for labor intensive industries/contracts.

⁷"The New Face of the Defense Industry," Business Week (January 10, 1977), p. 52.

⁸Ibid., p. 56

⁹Ibid.

¹⁰Council of Defense and Space Industry Associations, Letter to Profit '76 Project Director, Brigadier General J. W. Stansberry, quoted by Paul M. Trueger, ed., Administrative and Accounting Guide for Defense Contracts (Guide 7609-232S, Sep 1976), p. 10.

Given these differing positions as to potential profits under the new profit policy, the obvious question is, "To what extent are profits influenced by facilities investment?" To answer this, it is necessary to examine how a total profit objective might be derived under both the old and new defense profit policies.

An Hypothetical Example

Figure 4 summarizes the basic cost, profit and investment factors used to assess the potential impact on profits of the new defense profit policy. The use of hypothetical factors was essentially based on the recognition that in the "real world" each contract would have different costs, investments, and/or profit considerations. Granting this point, one should remember that the intent of this study is to address the potential impact of the new defense profit policy as to facilities investment. At issue is the extent to which the partial basing of profits on facilities investment will influence the total amount of contractor profits.

Five alternative profit calculations are presented, ranging from maximum contractor profits (Alternative A) to minimum contractor profits (Alternative E). Alternatives A and B differ only as to the weight placed on "contractor risk" (8% and 7%, respectively). A seven percent contractor risk factor was the maximum weight allowed under the old profit policy.

Note that five levels of facilities investment are presented. The "Profit '76" study staff computed an average ratio of .116 as the relationship of tangible capital assets to allowable costs for U.S.

FIGURE 4
Profit Factors

Profit Factors	Base	Weight Range	Alternatives				
			A	B	C	D	E
Part A - <u>Contractor Effort*</u>							
Material Acquisitions							
Subcontracted Items	\$ 4,950,000	1-5%	5	5	4	2	1
Purchased Parts	425,000	1-4%	4	4	3	2	1
Engineering							
Direct Labor	1,650,000	9-15%	15	15	13	11	9
Overhead (80%)	1,320,000	6-9%	9	9	8	7	6
Manufacturing							
Direct Labor	6,050,000	5-9%	9	9	8	6	5
Overhead (200%)	<u>12,100,000</u>	4-7%	7	7	6	5	4
Total Cost Input	\$26,495,000						
General Management (9.96%)	<u>2,639,000</u>	6-8%	8	8	7	6	6
TOTAL EFFORT	\$29,134,000						
Part B - <u>Contractor Risk</u>	\$29,134,000	0-8%**	8	7	6	3	0
Part C - <u>Facilities Investment</u>	***	6-10%	10	10	9	7	6

*The weight range for each separate profit factor does not differ between the old and new profit policies.

**The weight range under the old profit policy was 0-7%.

***Five separate ratios of facilities investment to total cost effort were analyzed for each alternative.

Approximates the	.06 - \$1,748,000
Profit '76 average ratio ---	.12 - \$3,496,000
	.18 - \$5,244,000
	.24 - \$6,992,000
	.30 - \$8,740,000

government profit centers.¹¹ Allowing for the presence of intangible capital assets, a contract facilities capital employed of \$3,496,000 (reference Figures 1 and 2) is roughly 12 percent of the estimated contractor effort of \$29,134,000 (reference Figure 4). Other facilities investment ratios are based on this .12 ratio.

The Profit Results

As was discussed above, the new profit policy incorporates procedures so that "...on the average the contracting officer's prenegotiation profit objective takes into account (and offsets) the cost increase attributable to the imputed cost of facility capital."¹² This offset requirement was apparently included in the final profit policy in response to concerns that "total profits," and thus contract price, would be unduly increased by both recognizing profit on facilities investment and allowing the imputed cost of money factor.

Was this concern justified? At least within the context of the example used by this study the answer is "mixed." The results of applying the various profit factors are presented in Figure 5. These results are in turn summarized in Figure 6 for both the old profit policy (four alternatives) and the new profit policy (25 alternatives). Included in the "total profit" figures under the new profit policy are the relevant contract facilities capital cost of money (8.25% of the relevant contract facilities capital employed).¹³

¹¹ U.S. Comptroller General Report #B-159896, p. 3.

¹² DPC 76-3, p. i.

¹³ An 8.25% rate is assumed as the arithmetic mean of the interest rates specified by the Secretary of the Treasury pursuant to Public Law (P.L.) 92-41 (85 Stat 97).

FIGURE 5

Determinants of Contract Profits
(thousands of dollars)

	A		B		C		D		E	
	Old	New	Old	New	Old	New	Old	New	Old	New
Cost Effort*	-	1,563	2,233	1,563	1,926	1,348	1,508	1,055	1,226	858
Risk	**	2,331	2,039	2,039	1,748	1,748	874	874	-	-
Other***	-	-	225	-	193	-	125	-	65	-
Facilities Investment										
.06 - \$1,748,000	-	175	-	175	-	157	-	122	-	105
.12 - \$3,496,000	-	350	-	350	-	315	-	245	-	210
.18 - \$5,244,000	-	524	-	524	-	472	-	367	-	315
.24 - \$6,992,000	-	699	-	699	-	629	-	489	-	420
.30 - \$8,740,000	-	874	-	874	-	787	-	612	-	524

*Under the new defense profit policy cost effort is adjusted by a .7 factor so as to weight this profit element as roughly 50% of total profit.

**Maximum weight of this profit factor under the old profit policy was 7%.

***Approximately 5% of total profits under the old profit policy was based on other factors.

FIGURE 6

Total Contractor Profits --- Cost of Money Offset
(thousands of dollars)

	A	B	C	D	E
<u>"Old" Profit Policy</u>					
Amount	-	\$4,498	\$3,867	\$2,507	\$1,291
As a Percent of Cost	-	15.4%	13.3%	8.6%	4.4%
<u>"New" Profit Policy</u>					
<u>.06 Facilities Investment</u>					
Amount	\$4,213	\$3,922	\$3,397	\$2,196	\$1,107
As a Percent of Cost	14.5%	13.5%	11.7%	7.5%	3.8%
<u>.12 Facilities Investment</u>					
Amount	\$4,532	\$4,241	\$3,699	\$2,463	\$1,357
As a Percent of Cost	15.6%	14.6%	12.7%	8.5%	4.7%
<u>.18 Facilities Investment</u>					
Amount	\$4,851	\$4,560	\$4,001	\$2,729	\$1,606
As a Percent of Cost	16.7%	15.7%	13.7%	9.4%	5.5%
<u>.24 Facilities Investment</u>					
Amount	\$5,170	\$4,879	\$4,302	\$2,996	\$1,855
As a Percent of Cost	17.7%	16.7%	14.8%	10.3%	6.4%
<u>.30 Facilities Investment</u>					
Amount	\$5,489	\$5,198	\$4,604	\$3,262	\$2,104
As a Percent of Cost	18.8%	17.8%	15.8%	11.2%	7.2%

Somewhere between a .12 and a .18 ratio of capital investment to contract costs, "total profits" under the new profit policy approximate profits under the old policy. Below a .12 ratio (which approximates the ratio determined by the "Profit '76" study to represent the average ratio of 62 contractors studied), profits under the old policy considerable exceed "total profits" under the new policy. The reverse is true when the facilities investment ratio exceeds .18. For capital intensive contractors "total profits" are increased beyond the profit levels attainable under the old profit policy.

What would happen if a contractor's "total profits" (i.e., the net profit objective plus the facilities capital cost of money) were to be less under the new policy than they had been under the old policy? Given a contractor's focus on profits and return on investment (ROI), one might anticipate pressure to at least maintain profits at their former level. Within the parameters of the new profit policy this could be accomplished simply by increasing the weights on the various elements of contract risk and/or contract effort.

For example, using the data of Figure 6, assume that a contractor had previously earned profits of 13.3 percent on total contract cost (i.e., Alternative C). If this contractor had a facilities investment ratio of .12, "total profits" under the new profit policy would drop to 12.7 percent of costs. By simply increasing the weights on various elements of contract effort and/or risk, a "total profit" rate of 13.3 percent of costs could be maintained.

One should note, however, that as the weight placed on contractor cost effort is increased, so too is the amount of the offset increased.

Using the various cost, profit and investment factors stated in Figure 4, Figure 7 illustrates this relationship. As the weight placed on contractor cost effort increases (Alternative E places the least weight thereon), the amount offset also increases. It is only when the ratio of facilities investment to allowable costs is at least .18 that the amount of facilities capital cost of money (FCCM) exceeds the amount offset (.3CE), and then only for Alternative E.

What If There Were No Offset?

As was noted in the preceding section, an offset requirement was included in the new profit policy apparently in response to expressed concerns that "total profits," and thus contract price, would be unduly increased if both profit on facilities investment were recognized and the imputed cost of money were allowed. Was this concern justified? At least within the context of the example used by this study the answer is "yes."

Figure 8 presents total contractor profits without the offset for the imputed cost of contract facilities cost of money. To each of the "total profit" levels presented in Figure 6 was added 30 percent of the relevant contractor cost effort.

At all levels of facilities investment profits under the new profit policy (without offset) would exceed profits attainable under the old policy. Only at the .06 level of facilities investment are profits under the two approaches roughly equivalent.

Goals to Profit Contribution

As was noted earlier, the new profit policy calls for contractor profits to be based on contract cost effort (50%), contract risk (40%),

FIGURE 7

The Relationship of Facilities Capital Cost of Money and the Offset Thereof

	Investment Level				
	.06	.12	.18	.24	.30
Cost of Money (at 8.25%)	<u>\$1,748,000</u>	<u>\$3,496,000</u>	<u>\$5,244,000</u>	<u>\$6,992,000</u>	<u>\$8,740,000</u>
Amount Offset	\$144,210	\$288,420	\$432,630	\$576,840	\$721,050
A	\$670,026	\$670,026	\$670,026	\$670,026	\$670,026
B	670,026	670,026	670,026	670,026	670,026
C	577,674	577,674	577,674	577,674	577,674
D	452,322	452,322	452,322	452,322	452,322
E	367,887	367,887	367,887	367,887	367,887

FIGURE 8

Total Contractor Profits Without Cost of Money Offset
(thousands of dollars)

	A	B	C	D	E
<u>"Old" Profit Policy</u>					
Amount	-	\$4,498	\$3,867	\$2,507	\$1,291
As a Percent of Cost	-	15.4%	13.3%	8.6%	4.4%
<u>"New" Profit Policy</u>					
<u>.06 Facilities Investment</u>					
Amount	\$4,884	\$4,592	\$3,975	\$2,648	\$1,475
As a Percent of Cost	16.8%	15.8%	13.6%	9.1%	5.1%
<u>.12 Facilities Investment</u>					
Amount	\$5,202	\$4,911	\$4,277	\$2,915	\$1,724
As a Percent of Cost	17.9%	16.9%	14.7%	10.0%	5.9%
<u>.18 Facilities Investment</u>					
Amount	\$5,521	\$5,230	\$4,578	\$3,181	\$1,974
As a Percent of Cost	19.0%	18.0%	15.7%	10.9%	6.8%
<u>.24 Facilities Investment</u>					
Amount	\$5,840	\$5,549	\$4,880	\$3,448	\$2,223
As a Percent of Cost	20.0%	19.0%	16.8%	11.8%	7.6%
<u>.30 Facilities Investment</u>					
Amount	\$6,159	\$5,868	\$5,181	\$3,715	\$2,472
As a Percent of Cost	21.1%	20.1%	17.8%	12.8%	8.5%

and contract facilities investment (10%). To what extent are these goals attainable? Figures 9 and 10 summarize this goal attainment for each of the various profit alternatives. Figure 9 identifies profit goals as a percentage of the basic profit objective. Figure 10 presents the four profit elements as a percentage of "total profits."

If one ignores facilities capital cost of money and focuses only on the stated profit objective, only at the .12 facilities investment level (which approximates the "Profit '76" study mean) is the facilities investment factor roughly 10 percent of profits. Note, however, that at this investment level "total profits" under the new policy are less than profits computed under the old policy (reference Figure 6). At all investment levels and nearly all alternatives, contract cost effort was less than the profit policy goal whereas contract risk exceeded the goal.

If, however, one chooses to view "total profits" as the relevant figure for assessing the attainment of profit goals, the results are quite different. At the .06 level of facilities investment, the total return on the investment in capital facilities (i.e. facilities capital cost of money plus that profit element on facilities investment) is roughly equal to 10 percent of "total profits." At this level profits on cost effort and contract cost risk also are relatively close to the overall profit policy goals. Note, however, that at the .06 investment level "total profits" are considerably less than attainable under the old profit policy.

One additional point should be noted. The profit attainment percentages cited in Figures 9 and 10 reflect the offset of cost of money

Figure 9

Attainment of Profit Goals
(as a percentage of basic profit objective)

	"Goal"	Mean*	A	B	C	D	E
<u>"Old" Profit Policy</u>							
Cost Effort	.65	.567	-	.496	.498	.602	.950
Risk	.30	.383	-	.453	.452	.349	0
Other	.05	.050	-	.050	.050	.050	.050
<u>"New" Profit Policy</u>							
<u>.06 Facilities Investment</u>							
Cost Effort	.50	.452	.384	.414	.414	.514	.891
Risk	.40	.495	.573	.540	.537	.426	0
Facilities Invmt	.10	.052	.043	.046	.048	.059	.109
Cost of Money	-	-	-	-	-	-	-
<u>.12 Facilities Investment</u>							
Cost Effort	.50	.430	.368	.395	.395	.485	.803
Risk	.40	.471	.549	.516	.512	.402	0
Facilities Invmt	.10	.099	.082	.089	.092	.113	.197
Cost of Money	-	-	-	-	-	-	-
<u>.18 Facilities Investment</u>							
Cost Effort	.50	.410	.354	.379	.378	.459	.731
Risk	.40	.449	.527	.494	.490	.380	0
Facilities Invmt	.10	.141	.119	.127	.132	.160	.269
Cost of Money	-	-	-	-	-	-	-
<u>.24 Facilities Investment</u>							
Cost Effort	.50	.391	.340	.363	.362	.436	.671
Risk	.40	.429	.508	.474	.469	.361	0
Facilities Invmt	.10	.180	.152	.162	.169	.202	.329
Cost of Money	-	-	-	-	-	-	-
<u>.30 Facilities Investment</u>							
Cost Effort	.50	.375	.328	.349	.347	.415	.620
Risk	.40	.410	.489	.455	.450	.344	0
Facilities Invmt	.10	.215	.183	.195	.203	.241	.379
Cost of Money	-	-	-	-	-	-	-
<u>All Investment Levels</u>							
Cost Effort	.50	.412	.355	.380	.379	.462	.743
Risk	.40	.451	.529	.496	.492	.383	0
Facilities Invmt	.10	.137	.116	.124	.129	.155	.257
Cost of Money	-	-	-	-	-	-	-

*Of relevant data cited in Figures 5, 6 and 7.

Figure 10

Attainment of Profit Goals
(As a percentage of "total profits")

	"Goal"	Mean*	A	B	C	D	E
<u>"Old" Profit Policy</u>							
Cost Effort	.65	.567	-	.496	.498	.602	.950
Risk	.30	.383	-	.453	.452	.349	0
Other	.05	.050	-	.050	.050	.050	.050
<u>"New" Profit Policy</u>							
<u>.06 Facilities Investment</u>							
Cost Effort	.50	.431	.371	.399	.397	.480	.775
Risk	.40	.471	.553	.520	.515	.398	0
Facilities Invmt	.10	.049	.042	.045	.046	.056	.095
Cost of Money	-	.049	.034	.037	.042	.066	.130
<u>.12 Facilities Investment</u>							
Cost Effort	.50	.392	.345	.369	.364	.428	.632
Risk	.40	.429	.514	.481	.473	.355	0
Facilities Invmt	.10	.090	.077	.083	.085	.099	.155
Cost of Money	-	.089	.064	.068	.078	.117	.212
<u>.18 Facilities Investment</u>							
Cost Effort	.50	.360	.322	.343	.337	.387	.534
Risk	.40	.394	.481	.447	.437	.320	0
Facilities Invmt	.10	.124	.108	.115	.118	.134	.196
Cost of Money	-	.122	.089	.095	.108	.159	.269
<u>.24 Facilities Investment</u>							
Cost Effort	.50	.333	.302	.320	.313	.352	.463
Risk	.40	.364	.451	.418	.406	.292	0
Facilities Invmt	.10	.153	.135	.143	.146	.163	.226
Cost of Money	-	.150	.112	.118	.134	.193	.311
<u>.30 Facilities Investment</u>							
Cost Effort	.50	.309	.285	.301	.293	.323	.408
Risk	.40	.338	.425	.392	.380	.268	0
Facilities Invmt	.10	.178	.159	.168	.171	.188	.249
Cost of Money	-	.175	.131	.139	.157	.221	.343
<u>All Investment Levels</u>							
Cost Effort	.50	.365	.325	.346	.341	.394	.562
Risk	.40	.399	.485	.452	.442	.327	0
Facilities Invmt	.10	.119	.104	.111	.113	.128	.184
Cost of Money	-	.117	.086	.091	.104	.151	.253
*Of relevant data cited in Figures 5, 6 and 7.							

(.3 x cost effort). If this offset were instead netted against the total return on the investment in capital facilities (as defined above), the resultant return on facilities investment would be negative throughout the .06 level of investment and for both alternatives A and B at the .12 level of investment. These two latter negative returns reflect the anomaly of the "average offset" increasing as the weight placed on cost effort increases (see the discussion of Figure 7).

SUMMARY AND CONCLUSIONS

The principle objective of those profit policy changes relating to facilities investment is to use profits as a motivating force to increase contractor capital investment in modern, cost-reducing facilities. The results of this study indicate a direct relationship between a contractor's facilities investment and the level of contractor total profits (net profit objective plus cost of money). As the ratio of facilities capital employed to allowable contract costs increases, profits do in fact increase. However, it was also demonstrated that "total profits" attainable under the new profit policy may well be less than profits attainable under the old policy. Moreover, except at relatively high levels of facilities investment (a .18 ratio and above), the amount offset (.3 x contractor cost effort) normally would be greater than the amount allowed for facilities capital cost of money.

Within the parameters of the example used for this study, the ratio of contract facilities capital employed to allowable contract costs had to be nearly .18 before "total profits" under the new policy

were roughly equivalent to profits attainable under the old policy. If the facilities investment ratio were .12 (roughly the "Profit '76" average), total profits would be less under the new profit policy.

With respect to "fears" that profits would be inflated if there were no offset for the imputed cost of money, it was found that profits would indeed be increased in the absence of an offset. Indeed, it was only at the .06 level of facilities investment that profits under the new policy (without offset) were roughly equivalent to profits attainable under the old policy.

At least within the parameters of this study there appears to be little doubt as to the need for some form of offset. However, profits attainable under the new profit policy appear to be overly weighted in favor of the capital intensive contractor.

The DOD has stated that at some future time the 10 percent relative weight assigned to facilities investment will be reevaluated with a view toward increasing this weight. Depending on how this increase is implemented, it is submitted that such an increase may be counterproductive. While capital intensive contractors may benefit from such a change, profits of noncapital intensive contractors may drop to unacceptably low levels.